

Pre-course workshop proposal for ISVEE 16

Please receive our proposal for a pre-conference workshop at ISVEE 16 in Halifax.

Title “Introduction to practical disease modeling”

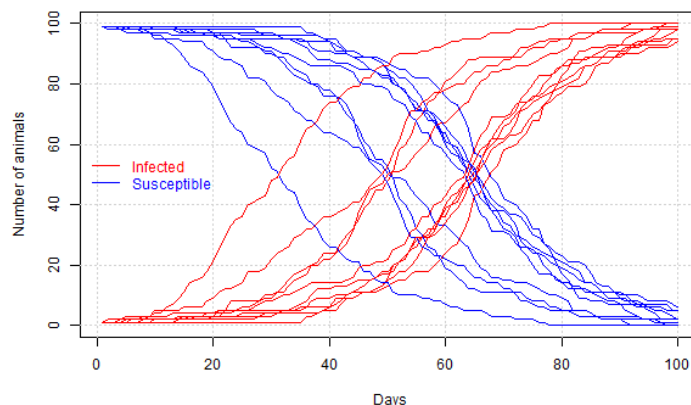
Motivation This workshop is a modification of a previous special PhD course run in partnership by the University of Sydney and the University of Copenhagen. Additionally, two previous editions of this course were run at the Technical University of Denmark.

The course is aimed at students who want to learn how to code their own model of disease spread in a population. We have designed the course to have stepwise learning outcomes using the spiral learning principle, slowly expanding the knowledge of the participants. We start with a basic introduction to disease modelling, and end with hands-on experience of a model that can be used as a template for modelling a range of infectious diseases.

We are four experienced teachers with many years of modelling experience: *Michael Ward*, Professor at the University of Sydney; *Victoria Brookes*, Lecturer at the University of Sydney; *Matt Denwood*, Associate Professor at the University of Copenhagen; and *Carsten Kirkeby*, Senior Researcher at the University of Copenhagen.

Learning objectives course participants will able to:

- Understand infectious disease principles relevant to disease modelling
- Construct a dynamic model framework, implemented in R
- Determine model characteristics and requirements for validation
- Use the model to investigate a research question



Prerequisites The participants must have moderate-level skills in R in order to be able to follow the course.

Duration The course is designed as a 2-day course, allowing tuition about the theoretical foundations of modelling as well as hands-on modeling experience in R.

Minimum/Maximum participants We will be able to run the course with minimum 15 participants and maximum 25 participants.

Other details The working language of the workshop will be English. Participants will need to bring their own laptops with the necessary software pre-loaded (pre-course work will be distributed to the participants in advance of the workshop with full instructions and links to the free software required). Internet needs to be available to the participants during the workshop. Online participation will not be possible.

Course plan

Day	Time	Activity/Contents	Details
1	8:30-10:00	Introduction to disease models (+ infection risk and transmission rate / beta)	Powerpoint presentation
	10:00-10:30	Bio break	
	10:30-12:00	Introduction to a simple model framework	Powerpoint presentation + Hands-on exercises
	12:00-13:00	Lunch break	
	13:00-14:30	A simple model with disease dynamics 1	Hands-on exercises
	14:30-15:00	Bio break	
	15:00-16:30	A simple model with disease dynamics 2	Hands-on exercises
	16:30-18:00	A simple model with disease dynamics 3	Hands-on exercises
Day	Time	Activity/Contents	Details
2	8:30-10:00	A more complex model with disease and population dynamics 1	Powerpoint + Hands-on exercises
	10:00-10:30	Bio break	
	10:30-12:00	Model assumptions, validation, convergence and burn-in	Powerpoint presentation
	12:00-13:00	Lunch break	
	13:00-14:30	Model evaluation	Hands-on exercises
	14:30-15:00	Bio break	
	15:00-16:00	A more complex model with disease and population dynamics 2	Hands-on exercises